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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/198,376	11/24/1998	AKIRA OKAMOTO	NU-98035	2418

30743 7590 05/05/2003

WHITHAM, CURTIS & CHRISTOFFERSON, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

EXAMINER	
FLANIGAN, ALLEN J	
ART UNIT	**PAPER NUMBER**
3743	

DATE MAILED: 05/05/2003

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PTO-90C (Rev. 07-01)

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 41

Application Number: 09/198,376
Filing Date: November 24, 1998
Appellant(s): OKAMOTO ET AL.

Mary E. Goulet
For Appellant

MAILED
MAR 11 2003
GROUP 3700

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/14/2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The Examiner objected to the previously filed Appeal Brief for failing to comply with 37 C.F.R. 1.192(c) in that the Appellant asserted certain claims to be separately patentable (claims 26 and 27, for example) despite being rejected together with other claims (1 and 4) but failed to present arguments why these claims subject to the same rejection as claims 1 and 4 were separately patentable therefrom. Appellant declined the invitation to correct this

omission, arguing that the appeal brief presents "arguments pertaining to" claims 6 and 27, citing section A(1) of the brief. This section only argues against a specific reference (Genshiro), and makes no mention of the separate patentability of claims 26 and 27 relative to claims 1 and 4.

In addition, the Examiner pointed out the logical fallacy in grouping claims in a manner that provides overlap from one group to another. In other words, separately grouped claims should be mutually exclusive. If claims 1 and 4-6 can stand or fall together, and claims 6 and 27 can also stand or fall together, it is logical to presume that claim 27 is properly groupable with claims 1, 4, and 5. Similarly, if claims 26 and 27 can be considered together as a group, and are not separately patentable from each other, then claims 6 and 26 logically are groupable together as well, and thus all the claims could be considered as a single group, because none of the proposed groupings are mutually exclusive.

It is ultimately the prerogative of the Board to decide whether to group the claims together in view of the apparent lack of compliance with 37 C.F.R. 1.192(c). For the purposes of this appeal, the Examiner's Answer will treat the claims as being grouped according to the grounds of rejection presented herein.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

	VAN BUSKIRK	01-1992
	AMORE	03-1997
	BENSON et al.	10-1996
29800 A	GENSHIRO	09-1989

ulator-metal transition and giant magnetoresistance in La1-xSr xMnO3", Urushibara et Physical Review B, Vol. 51 No. 20 15 May 1995 pps. 14103-14109 Available at ://prola.aps.org/toc/PRB/v51/i20 (URISHIBARA ET AL.)

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 4, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kokai #1-229800 to Genshiro in view of Urishibara et al. and Van Buskirk.

Genshiro teaches the essential property of the disclosed invention: Temperature control via a layer of material whose properties change as a function of temperature. As discussed in the translation of Genshiro provided with the reference, the superconductive material undergoes a transition from a electrically highly conductive (low electrical resistivity) state, in which the emissivity (radiation heat transfer characteristic) of the material is low, to a less conductive (relatively higher electrical resistance) state in which the infrared radiation rate is increased. See Fig. 2 of Genshiro, showing a graph of the

emissivity $\varepsilon_{(T)}$ of the material as a function of temperature, and the transition temperature T_c at which this transition from a good emitter to a poor emitter of radiation occurs. Thus, Genshiro clearly teaches a "thermal control device comprising a substance . . . [which] exhibits emissivity characteristics of an insulator at a relatively high temperature and emissivity characteristics of a metal at a relatively low temperature, said substance having a relatively low emissivity at the relatively low temperature, and a relatively high emissivity at the relatively high temperature". Regarding the "object having said substance affixed thereto", note base plate 11, which is said to be of a "member such as artificial satellite".

Obviously, when comparing Genshiro with claims 1 and 6, for example, the only recitation of claim 1 not found explicitly disclosed in Genshiro is the specific thermal transition substance claimed.

Urishibara et al. disclose a material that undergoes a conductive transition (from highly conductive, low resistance to less conductive, higher resistance at a transition temperature T_c; see Figs. 2 and 6 of Urishibara et al.). Generally, the substitution of one material for another having equivalent properties is considered an obvious modification. The disclosure of Genshiro by itself is believed to adequately support *prima facie* the obviousness of substituting the material disclosed in Urishibara et al. due to their indication

that superconductive materials undergo a transition in both electrical properties (from superconductor to "normal" conductor) and in radiative properties. Presumably, any material known to undergo such a transition at a desired temperature would be suitable for the radiating board of Genshiro. The disclosure of Van Buskirk expressly recognizes the "close relation" between electrical conductance and optical (emissivity) properties of transition metal oxides (see lines 47-52 of column 1 of Van Buskirk). "The oxides of the transition elements are suitable for such selective radiation coatings. The greater the electrical conductance, the lower the emissivity". Manganese is a transition element (see any periodic table of elements). Thus, the teachings of Van Buskirk, Genshiro, and Urishibara et al. taken together strongly suggest that the particular material disclosed in Urishibara et al. (manganese oxides with perovskite structure) would exhibit the very properties described as necessary for the superconductive material of Genshiro: An inverse relationship between electrical conductance and emissivity (Van Buskirk), and a transition between high conductance and low conductance at a given temperature (Urishibara et al.).

Thus, the prior art teaches the basic mechanism of automatic temperature control via variable emissivity claimed, and recognizes the suitable properties of the specific materials claimed. It would therefore have been *prima facie* obvious to use the claimed material as the material for layer 13 of Genshiro. See MPEP § 2144.07.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benson et al. in view of Urushibara et al. and Van Buskirk.

Benson et al. teaches a thermochromic material (transition metal vanadium oxide is one example, but the disclosure is not limited thereto, and explicitly suggests that other materials would be suitable, see lines 58-62 of column 13) which "changes from the emissive, electrically insulating state to the non-emissive, metallic state as a function of temperature. When it is hot, it becomes more emissive, and when it cools, it becomes less emissive" (lines 22-25 of col. 13, *cf* the language of claim 26). This layer 170 is applied to an object (sidewall 12 of panel 10) and effectively controls its temperature by controlling the amount of radiation emitted to sidewall 14 in dependence on the temperature of sidewall 12.

Urushibara et al. disclose a transistion metal La_{1-x} Sr_x MnO_3 material that exhibits a transition between highly conductive and less conductive (electrically speaking) at a certain temperature range. Van Buskirk explicitly recognizes the "close relation" between electrical conductance and optical properties of transition metal oxides (see lines 47-52 of column 1). Thus, the prior art teaches the basic mechanism of automatic temperature control using a variable emissivity material claimed, and recognizes the suitable properties of the specific materials claimed. It would therefore have been *prima facie*

obvious to use the claimed material as the material for layer 13 of Genshiro. See MPEP § 2144.07.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genshiro in view of Urushibara et al. and Buskirk as applied to claim 4 above, and further in view of Amore.

Amore teaches the application of a layer of silicon or germanium semiconductor material to an antenna array for use in space to "aid in controlling temperatures" (abstract). As indicated in column 5, this coating reflects insolation (solar energy from the sun), but is highly emissive to heat energy, "so it tends to reflect the heat loading due to visible light, and allows radiation of energy due to the temperature of the interior structures of the array antenna". Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ this coating to obtain the *expected advantage* of preventing overheating due to insolation while allowing radiative cooling taught in Amore to the satellite of Genshiro, which is similarly cooled by controlled radiation. See MPEP 2144[1].

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benson et al. in view of Urushibara et al. and Buskirk as applied to claim 4 above, and further in view of Amore.

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[1] The strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. In re Sernaker, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983).

Please see the comments made above in regard to the teachings of Amore.

(11) Response to Argument

Appellant's comments in regard to Genshiro on pps. 6 and 7 are not commensurate with the scope of the claims, and misrepresent the disclosure of Genshiro. Nowhere in Genshiro does this reference indicate that it uses a "very low temperature" superconductive material, as Appellant asserts. Nor are the claims in any way limited to "room temperature applications"[2]. Appellant is certainly correct in implying that "at the time of the presently claimed invention", the "person of ordinary skill in the art" possessed of the teachings of Genshiro would have sought "known" materials (bottom of page 6 of the Brief), and Urishibara et al. establish that the claimed material was indeed "known" at this time. This is the basis of the prima facie finding of obviousness; selection of a known material whose properties were also known to those skilled in the art.

Appellant implies on p. 7 of the Brief that the rejection is based on a proposed substitution of a "non-superconductor" material for the superconducting material taught in Genshiro. However, Urishibara et al. explicitly refer to "superconductivity" in their paper (see first sentence in the

[2] Appellant may respond by asserting that the recitation of the specific material claimed limits the claims to room temperature applications, but Urishibara et al. makes clear that the transition temperature may be substantially adjusted depending on doping of the superconductor (see Fig. 6, showing different transition temperatures for different values of x).

"INTRODUCTION"), and their graphic plots of resistivity as a function of temperature shows extremely high conductivity, i.e. virtually zero electrical resistance value below the transition temperature (Fig. 6). Even assuming, *arguendo*, that the material disclosed in Urishibara et al. would not be considered a "superconductor" material, the fact remains that the material clearly exhibits the transition from higher conductivity to lower conductivity at a critical temperature described by Genshiro[3].

The teachings of Van Buskirk are relied upon solely to affirm the interrelated nature of emissivity and electrical conductivity in oxides of transition elements. It is not relied upon to provide some explicit suggestion that the material taught in Urishibara et al. can be substituted for the material of Genshiro. A *prima facie* finding of obviousness does not require such an explicit suggestion[4].

The arguments presented on pps. 12-14 contesting the alternate basis of rejection based on Benson et al. as a primary reference instead of Genshiro are also not persuasive. Benson et al. specifically indicate that other materials

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Benson et al. similarly imply that the transition temperature of vanadium oxide can be "designed in", column 13.

[3] Appellant's discussion of superconductor materials on pps. 7-9 fails to point out that all of the so-called "high temperature" superconductors known to date are perovskites.

[4] See In re Nilssen, 7 U.S.P.Q.2d 1500: "Nilssen urges this court to establish a 'reality-based' definition whereby, in effect, references may not be combined to formulate obviousness rejections absent an express suggestion in one prior art reference to look to another specific reference. We reject that recommendation as contrary to our precedent which holds that for the purpose of combining references, those references need not explicitly suggest combining teachings, much less specific references. See, e.g., In re Sernaker , 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983); In re McLaughlin , 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971)."

besides vanadium oxide can be used; the list provided in lines 62-64 of column 13 of Benson et al., which Appellant cites in the bridging sentence of pps. 13-14 of the Brief, is clearly exemplary and not limiting. As pointed out above, Urishibara et al. teach a transition metal oxide that, like the vanadium oxide of Benson et al., exhibits a change in electrical conductivity property as a function of temperature. Van Buskirk confirms that for transition metal oxides, resistivity and emissivity are closely related, giving a reasonable expectation of success regarding the transition metal oxide of Urishibara et al. exhibiting the same "high emissivity, low conductivity" property as Benson et al.'s vanadium oxide.

Finally, on pps. 15-16 of the Brief, Appellant points out that Amore does not teach the use of Mn perovskite oxide as a temperature controlling substance attached to an object to be temperature controlled (or in other words, Amore does not "anticipate" the claims). Such arguments are moot where the rejection is based on a combination of teachings. Urishibara et al., not Amore, is relied upon to show that the specific material claimed, and its relevant properties (exhibiting a thermally triggered transition from conductor to insulator) were known in the art at the time the instant invention was made.

A finding of obviousness does not require absolute predictability; a reasonable expectation of success is sufficient. Here, the prior art discloses several materials, as evinced by the references cited, which all share the characteristic of exhibiting a transition or change in electrical conductive

property at a certain temperature. Urishibara et al.'s manganese oxide perovskite exhibits the same property. Several of them, like Benson's vanadium oxide and other suggested materials, are transition metal oxides; so is Urishibara et al.'s. As noted above, all known high temperature superconductors are perovskites, as is Urishibara et al.'s material. Taken together, these facts would appear to provide ample support for the proposed subsitution.

For the above reasons, it is believed that the rejections should be sustained.

Henry Bennett
Supervisory Patent Examiner
Group 3700

Respectfully submitted,

Allen J. Flanigan
Primary Examiner
Art Unit 3743

AJF
March 10, 2003

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